Amendments to the Specification

Please amend the paragraphs at page 9, line 12 through page 13, line 13, in the following manner:

~~DISCLOSURE OF THE INVENTION~~ SUMMARY

~~It is a general object of the present invention to provide an image forming apparatus in which the above-mentioned problems are eliminated.~~

A more specific object of the present invention is to provide In an aspect of this disclosure, there is provided an image forming apparatus which can detect a leading edge and a width of a recording medium with a simple structure so as to prevent erroneous recording.

~~Another object of the present invention is to provide~~ In another aspect of this disclosure, there is provided an image forming apparatus which can perform an accurate control of conveyance of a recording medium by detecting a state of an interior or a surrounding area of a carriage having a recording head.

~~A further object of the present invention is to provide~~ In another aspect of this disclosure, there is provided an image forming apparatus which can perform an accurate control of conveyance of a recording medium by dynamically detecting a state of an interior or a surrounding area of a carriage having a recording head.

~~Yet another object of the present invention is to provide~~ In another aspect of this disclosure, there is provided an image forming apparatus which can control ejection of droplets so as to prevent the droplets from being landed onto a position outside a recording medium.

In ~~order to achieve the above-mentioned objects~~ another aspect, there is provided ~~according one aspect of the present invention~~ an image forming apparatus that forms an image on a recording medium, comprising: a carriage having a recording head to form the image by scanning the recording medium; and a detector provided in the carriage so as to detect a leading edge of the recording medium.

~~According to~~ In the above-mentioned ~~invention~~ apparatus, since the detector that detects a leading edge or a width of a recording medium is provided on

the carriage, the detection of the leading edge or width of the recording medium can be achieved with a simple structure, and erroneous recording can be prevented.

The above-mentioned image forming apparatus ~~according to the present invention~~ may further comprise an analog processing circuit that transmits an output signal of the detector. Alternatively, the image forming apparatus ~~according to the present invention~~ may further comprise a digital processing circuit that transmits an output signal of the detector.

Additionally, in the above-mentioned image forming apparatus ~~according to the present invention~~, the detector may be located at a position where the recording medium is detectable on an upstream side of an image formation start position by the recording head in a direction of conveyance of the recording medium, and also located on a side of an image forming area when the carriage is located at a home position.

There is provided according to another aspect of ~~the present invention~~ this disclosure an image forming apparatus that forms an image on a recording medium, comprising: a carriage having a recording head to form the image by scanning the recording medium; and a detector provided in the carriage so as to detect a width of the recording medium in a direction of scanning.

The above-mentioned image forming apparatus ~~according to the above-mentioned invention~~ may further comprise an analog processing circuit that transmits an output signal of the detector. Alternatively, the image forming apparatus ~~according to the present invention~~ may further comprise a digital processing circuit that transmits an output signal of the detector.

In the above-mentioned image forming apparatus ~~according to the above-mentioned invention~~, the detector may detect the width of the recording medium only when scanning is performed first. Additionally, in the image forming apparatus ~~according to the above-mentioned invention~~, the detector may be located at a position where the recording medium is detectable on an upstream side of an image formation start position by the recording head in a direction of conveyance of the recording

medium, and also located on a side of an image forming area when the carriage is located at a home position.

Additionally, there is provided according to another aspect of ~~the present invention~~ this disclosure an image forming apparatus that forms an image on a recording medium, comprising: a carriage having a recording head to form the image by scanning the recording medium; and a state detector that detects a state of an interior of the carriage or a state of an area surrounding the carriage, the state detector being mounted on the carriage.

~~According to~~ In the above-mentioned ~~invention~~ apparatus, the state detector, which detects a state of an interior of the carriage or a state of an area near the carriage, is provided in the carriage. Thus, a control that is based on a result of detection of the state of the interior of the carriage or the area near the carriage can be performed with high accuracy.

Please amend the paragraph bridging pages 13 and 14, in the following manner:

The above-mentioned image forming apparatus ~~according to the above-mentioned invention~~ may further comprise a conveyance belt that conveys the recording medium. The above-mentioned image forming apparatus ~~according to the above-mentioned invention~~ may further comprise a control part that determines whether the conveyance belt is dirty in accordance with a result of detection of the state detector. The state detector may comprise an infrared light sensor. Alternatively, the state sensor may comprise a temperature sensor that detects a temperature of an area surrounding the carriage.

Please amend the paragraphs at page 14, line 22 through page 21, line 19, in the following manner:

Additionally, there is provided according to another aspect of ~~the present invention~~ this disclosure an image forming apparatus that forms an image on a recording medium, comprising: a carriage having a recording head to form the image

by scanning the recording medium; and a state detector including an optical sensor that is mounted on the carriage so as to detect a state of an area surrounding the carriage.

~~According to~~ In the above-mentioned ~~invention~~ apparatus, since the state detector includes the optical sensor provided in the carriage so as to detect a state of an area near the carriage, an optimum control can be performed in accordance with a result of detection of the optical sensor.

In the above-mentioned image forming apparatus ~~according to the above-mentioned invention~~, the state detector may determine a kind of the recording medium in accordance with a result of detection of the optical sensor. Additionally, the kind of the recording medium may be determined in accordance with an analog output level of the optical sensor.

The above-mentioned image forming apparatus ~~according to the above-mentioned invention~~ may further comprise a conveyance member that conveys the recording medium by attaching the recording medium to a predetermined area of the a surface of the conveyance member, and wherein the state detector may detect a state of the surface of the conveyance member. The conveyance member may be an endless conveyance belt. Additionally, the state detector may detect blot on the conveyance belt in accordance with a result of detection of the optical sensor. Further, the state detector may detect damage on the conveyance belt in accordance with a result of detection of the optical sensor.

In the above-mentioned image forming apparatus ~~according to the above-mentioned invention~~, component parts other than a conveyance part, which is present within a detectable area of the state detector so as to convey the recording medium, may have color density levels different from a color density level of the recording medium being conveyed by the conveyance part. Additionally, the color density levels of the component parts other than the conveyance part may be different from a color density level of the conveyance part.

Additionally, there is provided according to another aspect of ~~the present invention~~ this disclosure an image forming apparatus that forms an image on a

recording medium, comprising: a carriage having a recording head to form the image by scanning the recording medium; an optical sensor that is mounted on the carriage; and component parts other than a conveyance part, which is present within a detectable area of the optical sensor so as to convey the recording medium, having color density levels different from a color density level of the recording medium being conveyed by the conveyance part. The color density levels of the component parts other than the conveyance part may be different from a color density level of the conveyance part.

Additionally, there is provided according to another aspect of ~~the present invention~~ this disclosure an image forming apparatus comprising: a carriage having a recording head that ejects droplets of liquid onto a recording medium for forming an image on the recording medium; and a state detector that detects presence of the recording medium along a moving line of the carriage, wherein when moving the carriage in a main-scanning direction to perform a printing operation, a part of the printing operation is cancelled after the state detector detects non-presence of the recording medium.

In the above-mentioned image forming apparatus ~~according to the above-mentioned invention~~, the state detector may be provided on an upstream side of the carriage in the main-scanning direction so as to cancel the part of the printing operation in the main-scanning direction after a position where non-presence of the recording medium is detected by the state detector in an initial scanning of the carriage for printing. Alternatively, the state detector may be provided on an upstream side of the carriage in the main-scanning direction so as to cancel the part of the printing operation in the main-scanning direction while detecting a position the recording medium is not present for each main-scanning of the carriage for printing.

In the above-mentioned image forming apparatus ~~according to the above-mentioned invention~~, a plurality of heads may be provided in the recording head so as to eject droplets in a plurality of colors by being arranged in the main-scanning direction, and the main-scanning of the carriage is continued after non-presence of the recording medium is detected by the state detector so as to cancel a printing operation

of each of the heads step-by-step while moving the carriage in the main-scanning direction. Additionally, an amount of movement of the carriage in the main-scanning direction and cancellation of the printing operations of the heads step-by-step are controlled, after the non-presence of the recording paper is detected, in accordance with information regarding an adjustment value of intervals between the heads.

In the above-mentioned image forming apparatus ~~according to the above-mentioned invention~~, a plurality of nozzle trains may be provided in the recording head so as to eject droplets in a plurality of colors by being arranged in the main-scanning direction, and the main-scanning of the carriage is continued after non-presence of the recording medium is detected by the state detector so as to cancel a printing operation of each of the nozzle trains step-by-step while moving the carriage in the main-scanning direction.

In the above-mentioned image forming apparatus ~~according to the above-mentioned invention~~, the carriage may be movable bidirectionally so as to perform bidirectional printing, and, when a part of the printing operation in one direction is cancelled, a part of the printing operation corresponding to an area where the printing operation is cancelled in the one direction is also cancelled in the printing operation in the other direction.

In the above-mentioned image forming apparatus ~~according to the above-mentioned invention~~, the carriage may be movable bidirectionally so as to perform bidirectional printing, and, the state detector is provided on each side of the carriage in the main-scanning direction.

In the above-mentioned image forming apparatus ~~according to the above-mentioned invention~~, the state detector may be provided on an upstream side of the carriage in a feed direction of the recording medium, and the printing operation is started after the state detector detects an edge of the recording medium while scanning the carriage in the main-scanning direction, and the state detector detects the edge of the recording medium for each min-scanning of the carriage so as to determine a position of the edge of the recording medium used in the printing operation of a subsequent line.

In the above-mentioned image forming apparatus ~~according to the above-mentioned invention~~, a plurality of heads may be provided in the recording head so as to eject droplets in a plurality of colors by being arranged in the main-scanning direction, and the main-scanning of the carriage may be continued beyond the edge of the recording medium detected by the state detector so as to cancel the printing operation of the heads step-by-step.

In the above-mentioned image forming apparatus ~~according to the above-mentioned invention~~, an amount of movement of the carriage in the main-scanning direction and cancellation of the printing operations of the heads step-by-step may be controlled, after each of the heads passes the edge of the recording medium, in accordance with information regarding an adjustment value of intervals between the heads.

In the above-mentioned image forming apparatus ~~according to the above-mentioned invention~~, a plurality of nozzle trains may be provided in the recording head so as to eject droplets in a plurality of colors by being arranged in the main-scanning direction, and the main-scanning of the carriage may be continued beyond the edge of the recording medium detected by the state detector so as to cancel the printing operation of the nozzle trains step-by-step.

In the above-mentioned image forming apparatus ~~according to the above-mentioned invention~~, the state detector may be provided at a position corresponding to the nozzle train closest to an edge off the recording head in the main-scanning direction.

Additionally, the above-mentioned image forming apparatus ~~according to the above-mentioned invention~~ may further comprise a conveyance belt that conveys the recording medium by electrostatically attracting the recording medium onto a surface of the conveyance belt.

Other ~~objects~~ aspects, features and advantages ~~of the present invention~~ will become more apparent from the following detailed description when read in conjunction with the accompanying drawings.